Demerec, M PNAS 32:36- 1946.

B/1. (called B in this paper). Ca. 5×10^8 phage / plate.

U.V. – GE lamps at 92 cm. = 4.2 ergs/sec. Exposed on plate

X-Ray / 80kv 25ma 2050 r/m.

111

24 hr bacteria concentrated to give 10^9/cc.

(term dropped from "phaging"???). Irradiated 0 – 4 min.
to lysis?

(Distinct increase in 4 hours from 0 to 295 of mutations is unirrad. cntl.)
somewhat greater ē U-V.

After 2 hours, increase of 10x in controls

1 min irr.	4.4
2 min	2.2
4 min	1.6.

mutation rate increases until 1-2 div., falls to normal by the 13th div
(6 hours). Killing not known.

Rubor, RJ + BD Davis JEM 83: 409 - 1946. Factors influencing the growth of the bacilli in liquid media.

Oleic esters (water sol) facilitating diffuse growth.
Serum albumins

Ammonium citrate - yes.

~~21658~~

Mendels, V. ← 21913
C.R. 1:548 1941. 4637

McDowan Clin MJ 48: 305 '41. Mutation Theory Cancer

G, BC Science + Culture 7: 299. 1941. Regarding wound hormones.

1. homologous to Loeb tumor
2. irradiated tumor cells - M. Ehrlich

Pelczar, M.J. + J.R. Porter, Arch. Bioch. 2: 323-329 '43.

The Nutrition of Proteus morganii Amino Acid + Growth Factor Req.

T(O) essentially pH 7.2-7.4 c̄ NaOH.

Cystine M/10[4]

Pnt 1γ/ml (intact)

Nic 1γ/ml nicotinic ac. or amide eq. effective.

~~Inf~~ Infusion medium ca. 2x as dense as synthetic. (c̄ amac.)

cystine or methionine is only essential amino ac. cystine better. Other a.a. have little effect.

~~Of~~ Aqueous exts. animal materials have a stimulating effect.
Norvaline, norleucine + allothreonine are inhibitory but reversed by other amino acids.

Purines + pyrimidines had no effect.

No. Bs. : B_1, B_2, B_6, choline, biotin, folic, pab, inos, pimelic, glutamine...

all tried s̄ effect.

Try Vitamin C, fat solubles, K, etc.

Bact, Med, State U. Iowa, Iowa City.

Meyers, F P + J.R. Porter, J Bact 50: 323-31 (1945) The nutrition of Proteus morganii: sulphur requirements.

Basal:

NH_4Cl	1.	Glucose	5 g
$(NH_4)_2SO_4$	1	Cystine	24 mg
NaCl	1	Pht	1 mg
KH_2PO_4	1	Nic	1 mg.
K_2HPO_4	1		
$MgSO_4$	1		
~~[illegible]~~			
H_2O	1 l.		

Other S- compounds (cystine 4+).

lanthionine	3+	
Methionine	2+	(variable)
Na_2S	2+	
Cysteine	variable !!	
homocystine	2+ var.	

Porter + Meyers. Arch Biochem 8: 169-176 (1945) Amino acid interrelationships in the nutrition of P. morganii.

~~Alloth~~ allothreonine reversed by 20 amino ac.
norvaline by leucine, meth, valine.
norleucine (l, d, dl) methionine. (leucine M/150)

Stokes, JL + H Gunness, J Bact 51:570 1946.

Thera competition of microorganisms

abstr.

Finley, H.E. Morehouse College, Atlanta Ga. Biotypes.
6(108): 31-) 1946.

Patterns of sexual reproductive cycles in ciliates.

Johnson E A + L F Rettger, J Bact 45: 127 - 1943

Yale

S. typhosa — no vits., tryptoph

S pullorum — 2/45 nic. through — leuc, asp / asp, arg / asp

S. gallinarum — B_1. \ - histidine — leuc, asp, glut

—— 0.

Rigler - Salmonella para A.

nic required in presence of glucose.

Doede, D.R. — Yale JBM 1945 — Eff. pH on nutr. req. Shigella, Lactobacillus ... See Dept Bact.

typhosa — IX, d., ...

gallinarum

pullorum

Wyss, O. PSEBM. 48:122- 1941. The Nature of SA inhibition

See Elvehjem.

$E + S \rightleftarrows ES \rightarrow E + P.$ $\quad K_s$

$E + I \rightleftarrows EI.$ $\quad K_i$

$$\frac{1}{v_i} = \frac{1}{V_o}\left(K_s + \frac{K_s}{K_i}(I)\right)\frac{1}{(S)} + \frac{1}{V_o}$$

then $\frac{1}{v_i}$ or $\frac{1}{S}$

$$\frac{1}{v_i} = k_s\left(1 + \frac{(I)}{K_i}\right)\cdot\frac{1}{(S)} + g.$$

$\frac{K_s}{V_o} = k_s$

$g = \frac{1}{V_o}$

$k_s = \frac{K_s}{V_o}$

$\frac{k_s}{g} = K_s.$

Genetics of Path. Organ.

Lewis
Diener
(Knaysi)
Dubos
Mellon
Bowen
Sherman + Wing.
Lindegren

JID 71:

Jennison, M.W. + S.P. Wadsworth J. Bact. 39: 389-97 (1940) Evaluation of the errors involved in estimating bacterial numbers by the plating method.

Reprint at Standard. Bull. Sci. Pharmacol (Ro.)

Perry, CA + Epstein. AJCP-T.S. 3:70-1 (1931) Problem the use of double-poured ~~plates~~ blood plates in the examination of throat cultures for hemolytic streptococci.

Behlau, J. Bot. Reid Pflanzen 26: 221 - 49 1939.

Alternation of generations in Chl. spp.

C. variabilis
paradoxa

Braarud, T. + Bigelthe, F., — BA 7: 1876

Cell = 2.98 x 10^{-12} g. N; .98 x 10^{-12} P

Rahn, O. JGP 14: 315 - 37 1931.

* Harvey Ann Bot 23 181 1909

* Strehlow, Z Bot 21: 625-92 1929 C paradoxa x polycystes

Kaiser-Wilhelm Inst; Berlin

Moewus, F. Biol Zentrbl. 60: 597-626 (1940). Uber Mutationen der Sexual Gene bei Chlamydomonas.

~~70°~~ 75° C. 15 m. → rate of mutation of .3%
6000 r → .002%.

60: 143-166 1940. Hormones.

60: 225-38 (1940). Uber Zoosporen-Kopulation be Monostroma.

M. wittrockia Copulation of gametes → zygote. In 2-3 weeks → sporophyte → 32 haploid zoospores
oreck!

60: 484-498 (1940) Botrydium granulatum

~~Whitford~~ Whitford, L.A. Freshwater algae of No Carolina (Ohio St U.) Abst Doct Dissert. C. fenestrata found. new form

Pätau, K. Zeit Abst Vererb. Stat. Moewus work prob 10^{-10}
79: 317-19 (1941).

Cornman, I. Bot Gaz. 104: 50-62 (1942). Colchicine

Chlamydomonas pseudococcus - resistant to .015%

*# Moewus, Zeit Abst Vererb 28: 418 1940 Inheritance [illegible]

Krupp's Zygote germination by soil extract. 10-14 da / generation

Lelois, L.F. + Muñoz, J.M. (1938) Ethyl Alcohol metabolism in animal tissues. Brit J. 32: 299-307.

"The action of kidney was especially marked in a rat which had previously received alcohol orally for a month".

fasting 24h. diminishes ~~O_2~~ Q_{EtOH} in liver.

Alcohol tolerant animals have livers with $Q_{EtOH} = 8$, at upper range of normal variation.

pyruvic acid stimulated alcohol disappearance, especially in fasted animals (undoubtedly a H acceptor).

Alcohol disappears more rapidly in intact tolerant animal, site of difference might be kidney?

Abdelhalden, E. et al. (1914). J. Physiol. Ch. (90: 369-387.

+ Bassani, E. Studien über das Verhalten des Blutserums gegenüber Dextrose, Lävulose u. Galaktose vor und nach erfolgter parenteraler Zufuhr dieser Zuckerarten.

Usually, no optical changes noted via any serum tested. Do. with serum effects on amino acids + on peptones.

+ Wildermuth, F. Weitere Untersuchungen über das Verhalten des Blutserums gegenüber Rohrzucker vor u. nach erfolgter parenteraler Zufuhr dieses Disaccharids. Versuche ~~mit~~ an Kaninchen. 23/24 rabbits responded
388 - 418.

The adapted rabbits showed no polarimetric activity on lactose or galactose. "Ein vorläufiger Versuch, durch Verfütterung von Milch eine Förderung des erwähnten Resultates herbeizuführen, war bis jetzt ohne Erfolg. Es wurden noch Versuche mit parenterale Zufuhr von Milchzucker in Angriff genommen, um festzustellen ob hier ganz ~~specific~~ spezifische Relationen vorliegen."

Used 10 cc 10% sugar. Activity found within 2 4h.

(1 cc serum (α_D = -.28° → +.25° initially → +.16 at 23h.)

L. Pasteur

Versuche an Hunden. sunder effects earth saw animals.

P. 3.
Present.

It is has come to be assumed that LA-22 is actually genetically a stable single mutant a single genetic although it was isolated on two types, does not react, and has a complex mutation.

Röhmann, F. (1917) Biochem. Z. 84:382 – Über die durch parenterale Rohrzuckerinjektionen "hervorgebrachten" Fermente des Blutserums von nüchternen Kaninchen.

Dr repeating earlier work, found adaptive serum sucrase to be quite irregular. Studied gravid animals to determine relation with lactogenesis. Regularly found sucrase in 7-10 days & sucrose disappearance in urine.

v. 57:380 (1913) 61:464 (1914); 72:26 (1915).

Plimmer, R.H.A., (1906-7) On the presence of lactase in the intestines of animals and on the adaptation of the intestine to lactose. J. Physiol 35:20-31.

For lactose metabolism:

JBC 81:541- (1929)

80:33-36.

See also JGP 19:879 lactose synthesis in mammary gland.

J Phys. 71:342

Corley. Disposal of intravenous lactose in rabbit

1 gm. adm. Unfermentable sugars returned to normal in 3 h.

>75% accounted for in the urine as non-ferment. red. sugars

Insulin had no effect. Anemia resulted in only slightly delayed removal. No blood lactase found.

Watkins & [illegible] Lactosuria [illegible] during confinement

Plimmer did not find adaptation to lactose
young animals contain lactose which is lost in later life

does not accept Weinland's conclusions on presence of enzyme in
adapted fowl intestine

Potter, VR + Klug, H.L. (1947) Dietary alteration of enzyme activity in rat liver. Arch Biochem 12: 241–248.

High fat diet did not increase citric acid oxidative activity of livers, ~~not any part of~~ fat fed livers showed marked decreases in octanoic oxidase when lysed. Succinoxidase < in high fat + high carbohydrate animals.

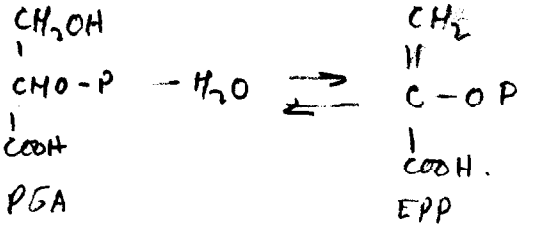
what is DBC in prev.

Lightbody HD + Kleinman A (1939) Variations produced by food diffrence in the concentration of arginase in the livers of white rats. JBC 129:71-78.

High protein diets caused a) increase in size
b) increase in relative arginase conc.

Gelatin augmentation caused b) & a).

Warburg, O. & Christian, W. (1942) Isolierung u Kristallisation des Gärungsfermente Enolase. Beitr Z. 310: 384–421.



Determinated spectrophotometrically a 240mμ in .5cm cell,

c̄ 3ml M/300 Also combines c̄ Zn.

Half saturated c̄ $MgSO_4$ in phosphate buffer at 2.8×10^{-3} pH 6.74

HCO_3 6.1×10^{-4} 7.34.

3 hypotheses for F inhibition:

1. binds Mg. 2. displaces substrate from enzyme Mg
3. a Mg F compound displaces Mg. 3 – affirmed.

When the product: $(Mg)(PO_4)(F^2)$ has same value, inhibition is same. c̄ Mg > M/100, F. inhibition was noted.

for OD^2 inhibition, 3.2×10^{-12} $(M/L)^4$.

Arsenate replaces phosphate. Pyrophosphate cannot, but is itself inhibitory.

Carboxylase is inhibited by fluoride at higher conc; Pi had no effect.

Wilson, W.J. (1910) Variations among bacteria. Brit Med Jl. (2), 1909-11

Understood selection vs. slow fermentation.

See Adami "Principles of Pathology" 1908. I: 104. and J Exp Med 4: 349 (1899)

n intermediate coli-typhi isolated:

Prompt (< 2da) fermentation of lactose at 22°. Negligible) >> 1/100 at 37. Secaled J.P.B. 14: 1 (1909) re detection. Showed no agglutinins associated with the lactase. lactase diffusible

at 37, Mtl, Mal and Glu fermented ± gas.

I. The utilization of lactose by Escherichia coli-mutabile. Deere, C.J., Dulaney, Anna D., and Michelson, I.D. J. Bact. 31: 625-633 (1936).

White form of Ecm uses very little lactose (determined as reducing sugar with Cu) before the red forms appear. NH_3 production indicates that amino acids are used as C source if lactose is unavailable

II. The lactase activity of Escherichia coli-mutabile. ib. 37: 355-363 (1939).

Used Shaffer-Somogyi (JBC 100:695-713 '33) method, with Reagent # 50 and 15 minutes heating. Thymol used to sterilize heavy cell suspensions (req. 1 hr.) Dry cells prepared after Morrison & Hisey (JBC 117: 693-706). Substrate was 50 ml ½% lactose in 1% acacia an M/10 P buffer 7.0-7.2.

Dried cells suspended in 25 ml 2% acacia in .2M P buffer, 10-20 mg thymol added and incub. 37 1-1½ h. 25 cc. 1% lactose added, and samples taken for analysis. .01% Cu used to stop enzyme action. Activity expressed as u = 2.5 mg lactose split / 12 h/ mg.

Lac+ grown on lactose had activity ca 2.8 if grown on lactose; 0.2 on plain agar, 0.1 on glucose. Lac- had activity of 1.0 on lactose, etc. on others. No difference whether dried or not. These values characterize the Lac- itself, as no Lac+ were seen at this interval, on Endo's agar.

III On the activation of the lactase of Escherichia coli-mutabile. Deere, C.J. J. Bact. 37:473-483.

"Earlier experiments led us to believe that the antiseptics employed "activated" the lactase which was present, but inactive, in living growing cultures of the non-lactose-fermening (white) form." Later found that drying would also activate lactase while only partially inhibiting glycolysis, so that Q_{O_2} might increase

Garrett white: /plain agar:	Wet:	Lac 11.7	Dry: 30.7	
		Glu 139	91.7	
/Lac	Wet:	Lac 19	72.6	
		Glu 136	132	
		-- 9		
Red: /plain		Lac 19.2	42.3	
		Glu 117	88.9	
Red:/Lac		Lac 128	1.8	This prep. was obviously overdried.
		Glu --	1.9	but may have been
		-- 7		too acid.

Ex tracts of dried cells contained demonstrable lactase.

No valid test was made of the possibility of lactase activation in Lac+, but he concluded that adaptation was based upon increased permeability rather than increased enzyme.

Papacostas G + J. Daté - Les associations microbiennes : leurs applications thérapeutiques.

Revue mix culture phénomènes